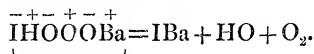


the metallic peroxide being reduced by the polar particle of oxygen, as in other cases it might be by hydrogen itself. The proof that such a chemical relation really exists between the particles of oxygen, would be found in the proportion in which the two substances were reduced. The paper contains an elaborate inquiry on this point in the case of the chloride and of the oxide of silver; the general result of which is, that these substances are capable of being reduced in various but definite proportions, according as the conditions of temperature and mass are varied. All the terms of this series of ratios have not been determined; but it is ascertained that the relative loss for the two substances proceeds by intermittent steps, and that the whole action is confined between the limits of the ratio of equality on the one hand, and the purely catalytic action (in which the metallic oxide would suffer no reduction) on the other; neither of which limits is ever absolutely reached.

The constant loss of oxygen from the decomposing bodies in equal equivalent proportions is found in the reaction of the peroxide of barium with iodine in the presence of water. In this experiment, the water in the presence of the iodine is reduced just as the peroxide in the other experiments; but here the loss is constant, and the change may be represented thus:—



In this experiment no oxide of iodine whatever is formed, and the author considers that the formation of the oxygen itself is here the corresponding fact to the formation of the iodous acid, which takes place when iodine acts upon baryta.

4. "The Calling of the Sea." By Richard Edmonds, Jun. Communicated by W. J. Henwood, Esq., F.R.S.

In this communication the author states, that in the neighbourhood of Penzance there is often heard inland a murmuring or a roaring noise, locally termed "the calling of the sea," which on some occasions extends to the distance of eight or ten miles; whereas, at other times, although to a person on the shore the sea may be equally loud, and the state of the weather may appear equally favourable, no sound from the sea can be heard at the tenth part of that distance. From his observations during six years, he concludes, that when the calling of the sea proceeds from a direction different from the wind, or when it occurs during a calm, it is usually followed within six hours by a wind from the quarter from which it is heard.

5. "On the Structure of the Membrana Tympani in the Human Ear." By Joseph Toynbee, F.R.S. &c. &c.

In this paper the membrana tympani is described as consisting of the following layers, which are quite distinct from each other, both as regards their structure and functions:—

1. Epidermis.
2. The proper fibrous layer, composed of—
  - a. The lamina of radiating fibres.
  - b. The lamina of circular fibres.

3. Mucous membrane.

One of the principal objects of the paper is to describe the structure and functions of the fibrous laminæ. Since the time of Sir Everard Home, who pronounced the layer of radiating fibres to be muscular, anatomists have differed in their views of the nature of the fibrous element of the *membrana tympani*. The lamina of radiating fibres, the outer surface of which is covered by the epidermis, is described as continuous with the periosteum of the external meatus. With the exception of the uppermost fibres, which on account of their being somewhat flaccid have been considered as a separate tissue under the name of "*membrana flaccida*," the radiate layer is composed of fibres which extend from the circular cartilaginous ring to the malleus, and they interlace in their course. These fibres are from the 4000th to the 5000th part of an inch in breadth.

The lamina of circular fibres consists of circular fibres, which are firm and strong towards the circumference, but very attenuated towards the centre. These fibres are so attached and arranged as to form a layer of membrane, which in a quiescent state is saucer-shaped. The fibres composing the circular are smaller than those of the radiate lamina, being from the 6000th to the 10,000th part of an inch in breadth.

The facts that appear to be adverse to the idea of the fibres of either layer being muscular are—

1. The absence of distinct nuclei in the fibres.
2. Their great denseness and hardness.

It is next shown that the four laminæ forming the *membrana tympani* are continuous with other structures, of which they appear to be mere modifications, and that not one is proper to the organ.

The tensor tympani ligament, which had not been previously noticed by anatomists, is particularly described; it is attached externally to the malleus, close to the insertion of the tensor tympani muscle, and internally to the cochleariform process.

The latter part of the paper is occupied by observations on the functions of the fibrous laminæ and of the tensor ligament of the *membrana tympani*; and it is shown that by these two antagonistic forces, the one tending to draw the *membrana tympani* inwards, the other outwards, this organ is maintained in a state of moderate tension, and is always in a condition to receive ordinary sonorous undulations.

6. "Investigations into the Structure and Development of the Scales and Bones of Fishes." By W. C. Williamson, Esq. Communicated by W. B. Carpenter, M.D., F.R.S.

In this memoir the author first points out the discrepancies that exist between the opinions of M. Mandl and M. Agassiz respecting the structure and growth of cycloid and ctenoid scales; and after